Primary Graft Dysfunction and VA ECMO Support After Heart Transplantation in the Current Era: A Single-Center Experience

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Background

Primary graft dysfunction (PGD) after heart transplantation is increasing alongside broader use of donation after circulatory death (DCD) donors, older donor hearts, and ex vivo perfusion systems.[1–5] Higher candidate acuity, longer wait times, and ongoing waitlist mortality have also encouraged broader donor utilization, potentially increasing observed PGD rates.[3,6,7]

Objective

To assess PGD rates after heart transplantation and the need for venoarterial extracorporeal membrane oxygenation (VA ECMO), stratified by donor type and retrieval/transport method. Outcomes included survival, index length of stay (LOS), and ECMO-related complications.

Methods

We retrospectively reviewed all heart transplants at a single center from January 2024 to June 2026. PGD was defined by ISHLT criteria, and VA ECMO cases were analyzed separately.[1] Donors were classified by type—DCD or donation after brain death (DBD)—and preservation method: Organ Care System (OCS), SherpaPak cold storage, or normothermic regional perfusion (NRP).[4,5] LOS was compared across PGD requiring VA ECMO, PGD without VA ECMO, and no PGD.

Results

From January 2024 to June 2026, 114 heart transplants were performed; 40 patients developed PGD, and 13 required VA ECMO.

- 2024: 54 transplants; 17 PGD, including 5 requiring VA ECMO.
- 2025: 42 transplants; 18 PGD, including 4 requiring VA ECMO.
- 2026 (through June): 18 transplants; 5 PGD, including 4 requiring VA ECMO.

All patients survived with normalized graft function. Median index LOS was 36.5 days for PGD requiring VA ECMO, 31 days for PGD without VA ECMO, and 22 days without PGD. Of 13 VA ECMO patients, 9 received DCD and 4 DBD hearts. Among DCD hearts, 8 used OCS and 1 used NRP with cold transport; among DBD hearts, 3 used SherpaPak and 1 used OCS. Plasmapheresis was used in 5 patients, dialysis in 5, and stroke occurred in 1.

Conclusions

In this single-center experience with high DCD use and ex vivo perfusion, PGD requiring VA ECMO was associated with excellent survival. Early VA ECMO support prolonged LOS but appeared to promote rapid graft recovery.[8,9] Adjunctive plasmapheresis may reduce SIRS and support recovery. These hypothesis-generating findings suggest a predominantly inflammatory, ischemia–reperfusion–mediated PGD phenotype and warrant prospective multicenter study.[2,10]

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